

**DRAFT**  
**Ecological Subsections of**  
**Denali National Park and Preserve, Alaska**

**Derived from Soil Survey 2002**

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**Prepared for**  
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## M135C.M6—Alaska Range Teklanika Alpine Mountains and Plateaus



### **Climatic Data:**

*Sub-regional Climate:* subarctic continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* northeastern

*Life zone:* interior alpine

*Elevation:* 415-1222 m

*Landforms:* low mountains and plateaus

*Vegetation:* alpine scrub and alpine dwarf scrub

*Parent Materials:* Tertiary age Nenana Gravels and Suntrana Sandstone mantled with a thin layer of loess generally less than 10 cm thick

**Geomorphic Processes:** permafrost, cryoturbation and braunification

**Permafrost Status:** discontinuous

**Major Soil Taxa:** Typic Historthels, Pergelic Eutrocryepts

**Detailed Soil Map Units:** 10ES, 10LM, 10P1, 10P2, and 10P4



## M135C.M6L—Alaska Range-Teklanika Boreal Mountains and Plateaus



### **Climatic Data:**

*Sub-regional Climate:* subarctic continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* northeastern

*Life zone:* interior boreal

*Elevation:* 333-1009 m

*Landforms:* low mountains and plateaus

*Vegetation:* dwarf spruce/ericaceous forest and cottongrass tussock

*Parent Materials:* Tertiary age Nenana Gravels and loess

**Geomorphic Processes:** permafrost and colluviation

**Permafrost Status:** continuous

**Major Soil Taxa:** Typic Historthels and Typic Histoturbels

**Detailed Soil Map Units:** 10ES, 10LM, 10P1, 10P2, and 10P4

## M135C.M7—Alaska Range-Toklat Basin Lowlands



### **Climatic Data:**

*Sub-regional Climate:* subarctic continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* northeastern

*Life zone:* boreal

*Elevation:* 441-825 m

*Landforms:* alluvial plains

*Vegetation:* low birch-cottongrass scrub, sedge-sphagnum bog

*Parent Materials:* Tertiary age Nenana Gravels and loess

**Geomorphic Processes:** permafrost and cryoturbation

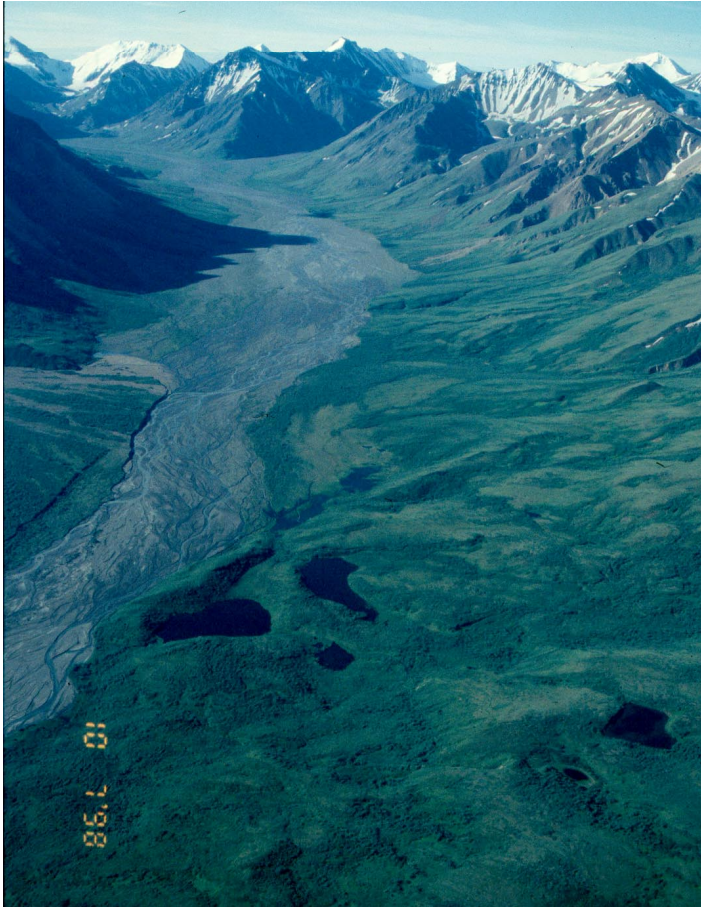
**Permafrost Status:** continuous with extensive areas of ice wedges

**Major Soil Taxa:** Typic Histoturbels, Typic Glacistels and Typic Cryofibrists

**Detailed Soil Map Units:** 10ES, 10LM, 10P1, 10P2, and 10P4



## M135C.V1—Alaska Range-Interior Alpine Flood Plains, Terraces and Fans



### **Climatic Data:**

*Sub-regional Climate:* subarctic continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* east-central, central, and west-central

*Life zone:* alpine

*Elevation:* 433-1298 m

*Landforms:* flood plains, terraces, and alluvial fans

*Vegetation:* alpine low to medium scrub

*Parent Materials:* holocene alluvium including schist, igneous intrusive rock types as well as mixed lithology

**Geomorphic Processes:** fluvial processes on flood plains and braunification and podzolization on terraces

**Permafrost Status:** sporadic

**Major Soil Taxa:** Pergelic Cryofluvents, Pergelic Oxyaquic Cryorthents, Pergelic Haplocryods

**Detailed Soil Map Units:** 7AF, 7AF2, 7FP2, 7FP21, 7FP3, 7G, 7ST, 7STF, 8FP1 and 8ST1

## M135C.V1L—Alaska Range-Interior Lowland Flood Plains, Terraces and Fans



### **Climatic Data:**

*Sub-regional Climate:* subarctic continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* east-central, central, and west-central

*Life zone:* alpine

*Elevation:* 280-1145 m

*Landforms:* flood plains, terraces, and alluvial fans

*Vegetation:* boreal scrub, white spruce/willow forest

*Parent Materials:* holocene alluvium including schist, igneous intrusive rock types as well as mixed lithologies

**Geomorphic Processes:** fluvial processes on flood plains and braunification and podzolization on terraces

**Permafrost Status:** sporadic

**Major Soil Taxa:** Typic Cryofluvents, Oxyaquic Cryorthents, and Typic Cryaquents

**Detailed Soil Map Units:** 5V2, 7AFF, 7FP1, 7FP11, 8FP2, 10V2, 11FP, 11G and 11<sup>ST</sup>



## M135S.B2—Alaska Range-South Central Nonvegetated Alpine Mountains



### **Climatic Data:**

*Sub-regional Climate:* maritime-continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* Alaska Range south of the hydrographic divide

*Life zone:* alpine

*Elevation:* 210-6188

*Landforms:* mountains and glaciers

*Vegetation:* non-vegetated

*Parent Materials:* colluvium of mixed lithology

**Geomorphic Processes:** colluviation

**Permafrost Status:** none

**Major Soil Taxa:** none

**Detailed Soil Map Units:** 9NV



## M135S.M5—Alaska Range-South Central Alpine Mountains



### **Climatic Data:**

*Sub-regional Climate:* maritime-continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* Alaska Range-south of the hydrographic divide

*Life zone:* alpine

*Elevation:* 273-2018 m

*Landforms:* mountains

*Vegetation:* alpine dwarf scrub, alpine scrub, and alpine herbaceous meadow

*Parent Materials:* mixed volcanic ash and colluvium and colluvium from mixed lithology bedrock

**Geomorphic Processes:** colluviation and podzolization

**Permafrost Status:** none

**Major Soil Taxa:** Pergelic Andic Dystrocryepts, Pergelic Humic Vitricryands, Pergelic Humicryods,

**Detailed Soil Map Units:** 9HS1, 9MS2, 9MSA, 9MSH, 9MSH1, 9SA4, 9SA44, 9TM, 9TM3, 9TM4, 9TP, 9TP2, 9V12

## M135S.M5L—Alaska Range-South Central Boreal and Subalpine Mountains



### **Climatic Data:**

*Sub-regional Climate:* maritime-continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* Alaska Range-south of the hydrographic divide

*Life zone:* boreal and subalpine

*Elevation:* 63-1408 m

*Landforms:* mountains

*Vegetation:* subalpine alder scrub and boreal mixed paper birch white spruce forest

*Parent Materials:* mixed volcanic ash and loess over till, mixed volcanic ash and loess over colluvium, colluvium from mixed lithology bedrock

**Geomorphic Processes:** colluviation and podzolization

**Permafrost Status:** none

**Major Soil Taxa:** Pergelic Andic Dystrocrypts, Pergelic Humic Vitricryands, Pergelic Humicryods,

**Detailed Soil Map Units:** 9HS1, 9MS2, 9MSA, 9MSH, 9MSH1, 9SA4, 9SA44, 9TM, 9TM3, 9TM4, 9TP, 9TP2, 9V12



## 131B.L1—Kuskokwim Plain-Eolian Lowlands



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* northwestern

*Life zone:* boreal

*Elevation:* 153-649 m

*Landforms:* eolian plains and hills

*Vegetation:* boreal dwarf needleleaf/ericaceous forest, boreal dwarf needleleaf/cottongrass woodland, and mixed hardwood forest

*Parent Materials:* eolian loess and fine sand

**Geomorphic Processes:** permafrost and cryoturbation

**Permafrost Status:** continuous

**Major Soil Taxa:** Typic Historthels, Typic Histoturbels and Typic Haplocryods

**Detailed Soil Map Units:** 3BG, 3C, 3DH, 3FG, 3FG2, 3FG3, 3FGH, 3FP1, 3FP3, 3FU, 3FU2, 3FU3, 3FU4, 3FW1, 3G, 3H, 3Y

## 131B.V1—Kuskokwim Plain-Lowland Flood Plains and Terraces



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* northwestern

*Life zone:* boreal

*Elevation:* 202-641 m

*Landforms:* flood plains, terraces and alluvial plains

*Vegetation:* flood plains-riparian scrub, riparian white spruce/alder forest, boreal mixed forest; terraces and plains-boreal dwarf needleleaf/ericaceous forest, boreal dwarf needleleaf/cottongrass woodland

*Parent Materials:* silty alluvium, stratified loamy alluvium, and sandy and gravelly alluvium

**Geomorphic Processes:** fluvial processes, permafrost and cryoturbation

**Permafrost Status:** discontinuous

**Major Soil Taxa:** Typic Cryofluvents, Oxyaquic Cryorthents, Typic Historthels, Typic Histoturbels and Typic Haplocryods

**Detailed Soil Map Units:** 2FG, 2FP2, 2FP3, 2FW2, 2G, 2P, 2ST, 2ST2



## 131B.V2—Kuskokwim Plain-Minchumina Basin Lowlands



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* northwestern

*Life zone:* boreal

*Elevation:* 149-314 m

*Landforms:* alluvial plains, flood plains, fens, and lakes

*Vegetation:* flood plains-riparian scrub, riparian mixed forest; alluvial plains-boreal dwarf needleleaf/ericaceous forest, boreal dwarf needleleaf/cottongrass woodland; fens-sedge wet meadow

*Parent Materials:* silty alluvium, stratified loamy alluvium

**Geomorphic Processes:** fluvial processes, permafrost and cryoturbation

**Permafrost Status:** continuous

**Major Soil Taxa:** Typic Historthels, Typic Histoturbels, Fluventic Haplorthels, Typic Cryofluvents, Typic and Terric Cryofibrists

**Detailed Soil Map Units:** 1FP, 1FP2, 1FP3, 1FP4, 1FW1, 1G, 1ST, 1ST1, 1STW and 1STW2

## 213B.G1—Cook Inlet Glaciated Lowlands



### **Climatic Data:**

*Sub-regional Climate:* maritime-continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* southern and southeastern

*Life zone:* south central boreal

*Elevation:* 76-972 m

*Landforms:* till plains, hills and bogs

*Vegetation:* boreal mixed paper birch-white spruce forest, subalpine alder scrub, dwarf spruce/ericaceous woodland bog, sphagnum-sedge bog

*Parent Materials:* volcanic ash and loess over glacial till, organic material

**Geomorphic Processes:** podzolization, and hydromorphism

**Permafrost Status:** none

**Major Soil Taxa:** Andic Humicryods, Andic Haplocryods, Fluvaquentic Cryohemists, Typic Cryaquands

**Detailed Soil Map Units:** 12B, 12HS2, and 12HS3



## 213B.V1—Cook Inlet-Lowland Flood Plains, Terraces, and Fans



### **Climatic Data:**

*Sub-regional Climate:* maritime-continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* southern and southeastern

*Life zone:* south central boreal

*Elevation:* 61-992 m

*Landforms:* flood plains, stream terraces, and alluvial fans

*Vegetation:* riparian scrub, riparian black cottonwood forest, riparian mixed paper birch-

white spruce forest riparian sedge wet

*Parent Materials:* loamy alluvium, gravelly alluvium, organic material over variable texture alluvium

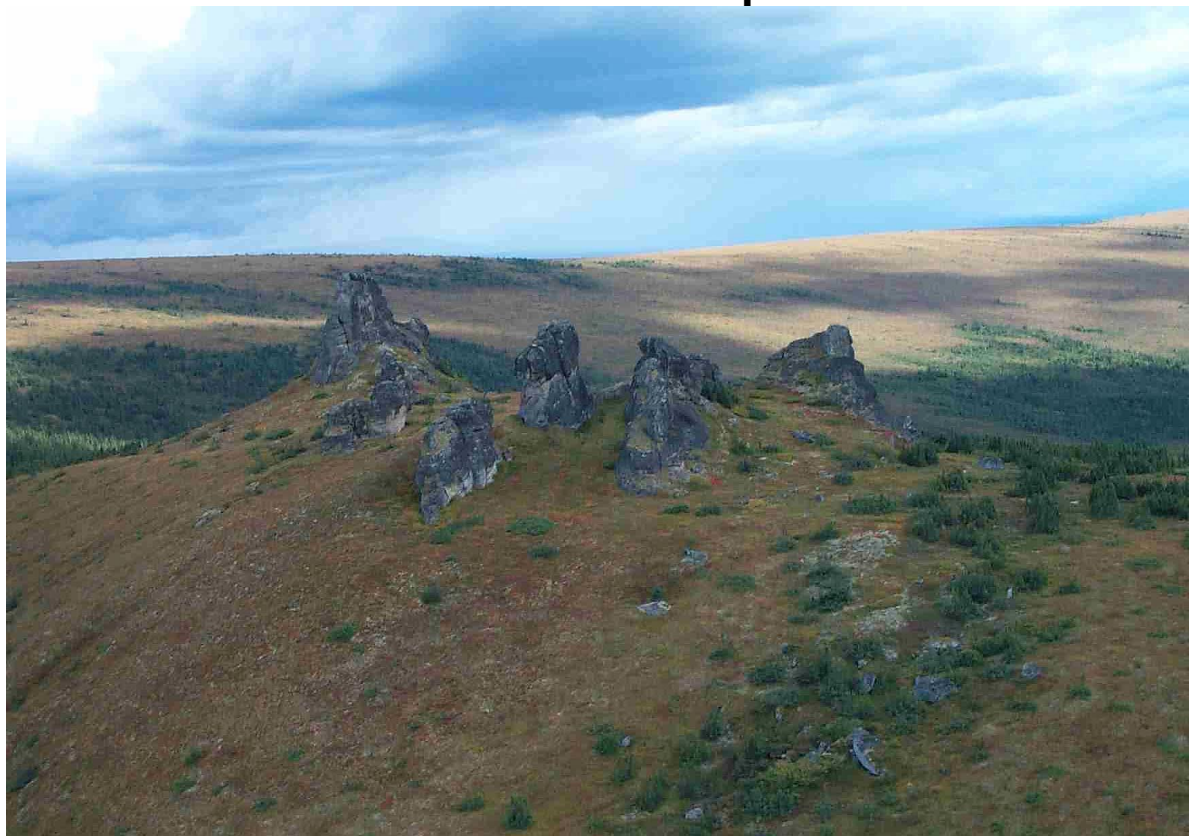
**Geomorphic Processes:** fluvial processes and hydromorphism

**Permafrost Status:** none

**Major Soil Taxa:** Typic Cryofluvents, Typic Cryaquents, Terric Cryofibrists, Oxyaquic Cryorthents

**Detailed Soil Map Units:** 13AF, 13AF2, 13F21, 13F22, 13FP, 13FP1, 13FP2, 13FPW, 13G

## M131C.M1A—Kuskokwim Mountains-Alpine Low Mountains



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* northwestern and west central

*Life zone:* alpine

*Elevation:* 197-632 m

*Landforms:* low mountain summits

*Vegetation:* alpine scrub and alpine cottongrass tussock

*Parent Materials:* mica-rich loess, schist cryoturbate

**Geomorphic Processes:** permafrost

**Permafrost Status:** continuous

**Major Soil Taxa:** Typic Histoturbels and Ruptic-Histic Aquiturbels

**Detailed Soil Map Units:** 4S1



## M131C.M1—Kuskokwim Mountains-Boreal Low Mountains



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* northwestern and west central

*Life zone:* boreal

*Elevation:* 178-611 m

*Landforms:* low mountains

*Vegetation:* boreal spruce forest and dwarf spruce/ericaceous forest

*Parent Materials:* mica-rich loess, schist colluvium

**Geomorphic Processes:** colluviation and permafrost

**Permafrost Status:** discontinuous

**Major Soil Taxa:** Typic Historthels and Typic Dystrocrypts

**Detailed Soil Map Units:** 4BS, 4BSS, 4FS and 4TS



## M135C.B1—Alaska Range-Nonvegetated Alpine Mountains



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* Alaska Range north of the hydrographic divide

*Life zone:* alpine

*Elevation:* 785-6125 m

*Landforms:* mountains

*Vegetation:* nonvegetated

*Parent Materials:* colluvium of variable lithology

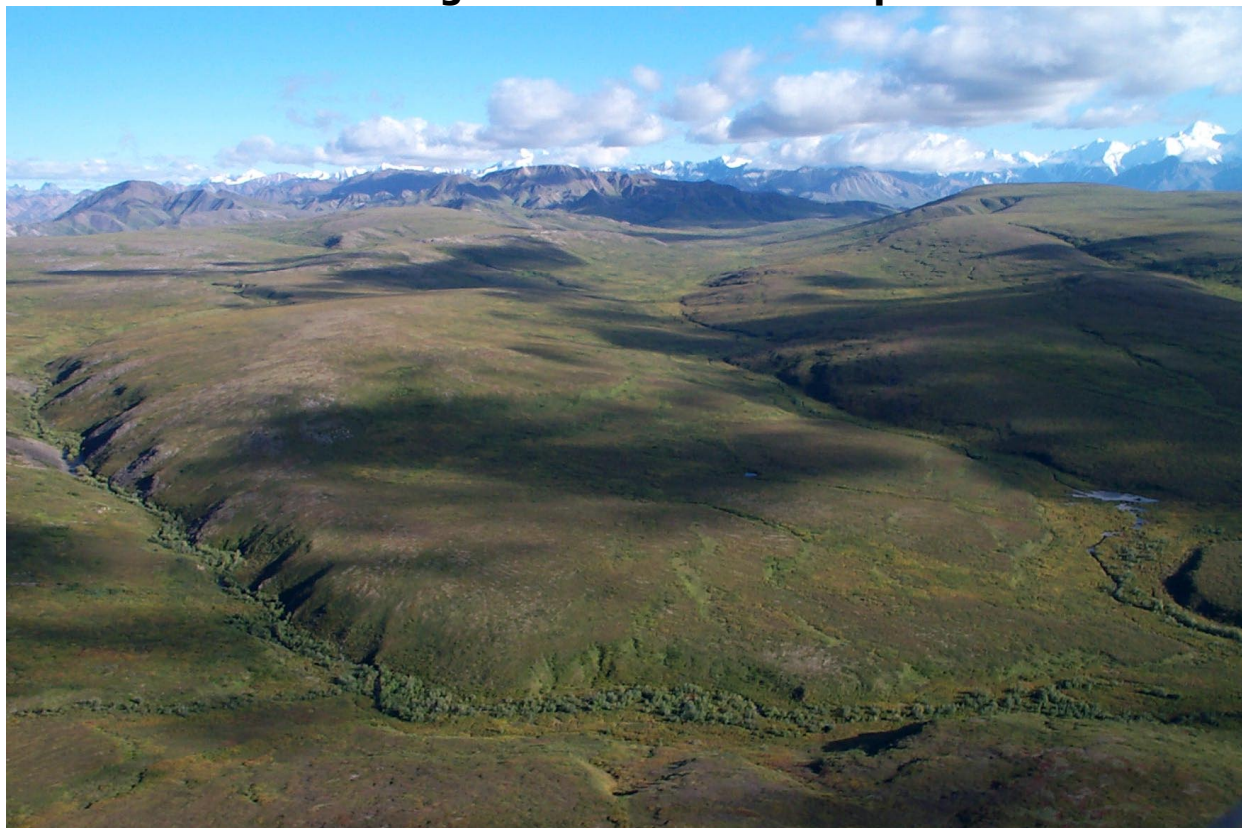
**Geomorphic Processes:** colluviation

**Permafrost Status:** none

**Major Soil Taxa:** none

**Detailed Soil Map Units:** 7NV, 5NV, 8NV

## M135C.G1—Alaska Range-Interior Glaciated Uplands



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* Alaska Range north of the hydrographic divide

*Life zone:* alpine

*Elevation:* 304-1536 m

*Landforms:* till plains, outwash plains, and hills

*Vegetation:* alpine scrub, alpine dwarf scrub, subalpine alder scrub

*Parent Materials:* thin mantle of loess over till and outwash

**Geomorphic Processes:** permafrost, podzolization, hydromorphism

**Permafrost Status:** discontinuous

**Major Soil Taxa:** Typic Historthels, Typic Histoturbels, Pergelic Haplocryods, Typic Eutrocryepts, Aquic Eutrocryepts

**Detailed Soil Map Units:** 7NG, 7NG2, 7NG3, 7P1, 7TP, 7TP2, 7TP8, 7ES, and 7FGA



## M135C.G1L—Alaska Range-Interior Glaciated Lowlands



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* east central, central, and west central

*Life zone:* boreal

*Elevation:* 445-982 m

*Landforms:* till plains, outwash plains, and hills

*Vegetation:* boreal white spruce/willow woodland and dwarf spruce/ericaceous forest

*Parent Materials:* thin mantle of loess over till and outwash

**Geomorphic Processes:** permafrost, podzolization, hydromorphism

**Permafrost Status:** discontinuous

**Major Soil Taxa:** Typic Historthels, Typic Haplocryods and Typic Cryofibrists

**Detailed Soil Map Units:** 7HF, 7P2, 7P4, 7P6, 7TP3, 7TP4, 7TP5



## M135C.M1—Alaska Range-Alpine Outer Range and Kantishna Hills



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* northeast and northcentral

*Life zone:* alpine

*Elevation:* 261-1546 m

*Landforms:* mountains

*Vegetation:* alpine dwarf scrub, alpine scrub, subalpine alder scrub

*Parent Materials:* colluvium derived from schist, mica rich loess over colluvium derived from schist

**Geomorphic Processes:** braunification, colluviation, and permafrost

**Permafrost Status:** discontinuous

**Major Soil Taxa:** Pergelic Dystrocrypts, Typic Historthels, Typic Histoturbels, and Ruptic-Histic Aquiturbels

**Detailed Soil Map Units:** 5P1, 5SA1, 5SA11, 5SA2, 5TS1, 8LM, 8LM1, 8LMV, 8MBS, 8MFS and 8MS

## M135C.M1L—Alaska Range-Boreal Outer Range and Kantishna Hills



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* northeast and northcentral

*Life zone:* boreal

*Elevation:* 211-1152 m

*Landforms:* mountains

*Vegetation:* boreal white spruce/willow forest, mixed paper birch-white spruce forest, dwarf spruce/ericaceous forest

*Parent Materials:* colluvium derived from schist, mica-rich loess over colluvium derived from schist

**Geomorphic Processes:** braunification, hydromorphism, colluviation, and permafrost

**Permafrost Status:** discontinuous

**Major Soil Taxa:** Humic Cryaquepts, Typic Dystrocryepts and Typic Historthels

**Detailed Soil Map Units:** 5MS21, 5TSF, 8LMF, 8LMVF, 8MFS1, and 8MVF



## M135C.M2L—Alaska Range-Interior Boreal Mountains



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* Alaska Range north of the hydrographic divide

*Life zone:* boreal

*Elevation:* 211-1152 m

*Landforms:* mountain footslopes

*Vegetation:* white spruce/willow forest and white spruce/alder forest

*Parent Materials:* loess over colluvium of variable lithology

**Geomorphic Processes:** colluviation, braunification, hydromorphism and permafrost

**Permafrost Status:** sporadic

**Major Soil Taxa:** Aquic Cryumbrepts, Typic Eutrocryepts, and Typic Historthels

**Detailed Soil Map Units:** 7MS2, 7MS4, and 7V2



## M135C.M2—Alaska Range-Interior Alpine Mountains



### **Climatic Data:**

*Sub-regional Climate:* continental

*Mean Annual Precipitation:*

*Mean Annual Air Temperature:*

### **Physiographic Description:**

*Location in Denali:* Alaska Range north of the hydrographic divide

*Life zone:* alpine

*Elevation:* 517 to 2053 m

*Landforms:* mountains

*Vegetation:* alpine dwarf scrub, alpine scrub, subalpine alder scrub

*Parent Materials:* colluvium of variable lithology

**Geomorphic Processes:** colluviation and braunification

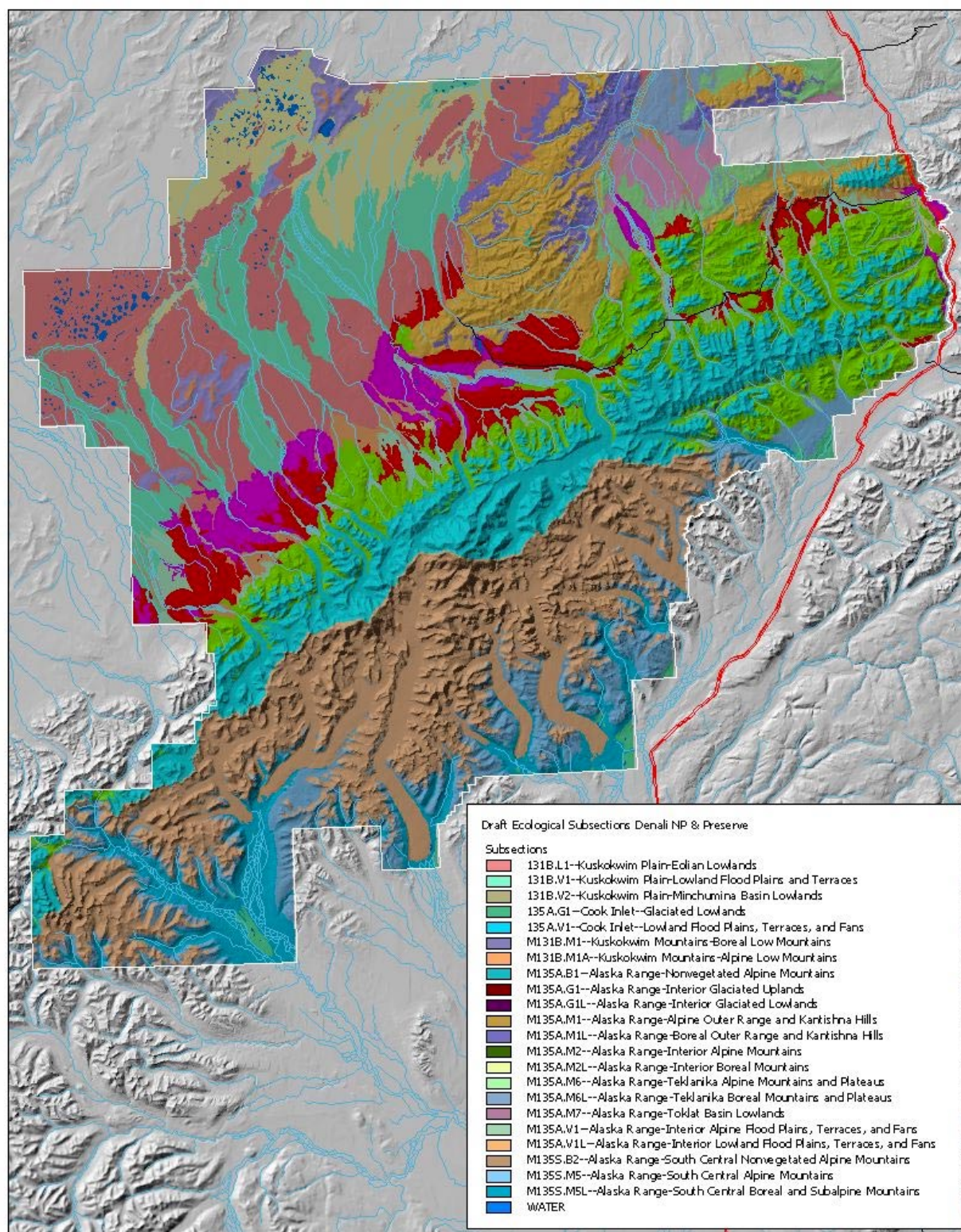
**Permafrost Status:** sporadic

**Major Soil Taxa:** Pergelic Eutrocrypts, Pergelic Cryoborolls, Pergelic Humic Eutrocrypts and Aquic Eutrocrypts

**Detailed Soil Map Units:** 7CE, 7CEF, 7MFA, 7MS1, 7MS3, 7MS31, 7MSA, 7MSC, 7MSH, 7MSHS, 7SA1, 7SA3, 7SA31, 7SA4, 7TM, 7TM1, 7TM2, 7TMS, 7V1, 7V11, 7V1A, 7V1B, 7V5



**Figure 1. Map of Ecological Subsections for Denali National Park and Preserve**



Denali Park Soil Survey-Ecoregions Subsection Descriptions  
(DRAFT 3/18/02)